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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,772	11/18/2002	Hwang Choe	24-NS-6042	2406

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EXAMINER	
RICHARDSON, JOHN A	

ART UNIT	PAPER NUMBER
3641	

DATE MAILED: 10/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/065,772	CHOE ET AL.
	Examiner	Art Unit
	John Richardson	3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. §133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *June 18 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Non Final Rejection

1). The applicant's letter dated June 18 2004 request for continuing examination (RCE) with new Information Disclosure Statement and based on amended claims 1-22 included in the applicant's letter dated February 23 2004, and communication dated May 03 2004 canceling claims 23-27, is acknowledged.

2). The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3). Claims 1 to 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patterson (U.S. 3,892,625) in view of JP 06-289178 (Yasuyaki).

The primary reference discloses a fast reactor fuel assembly flow orifice arrangement, comprising a nuclear reactor core (item 2), a plurality of fuel assemblies (items 19), each of the said assemblies incorporating a flow / opening / channel (items 20), a lower tie-plate / support structure (items 102), the said fuel assemblies configured in a plurality of core flow regions (Figure 1), and said core regions configured to specific core coolant flows (see for example, Column 3, lines 18-26), and each of the said fuel assemblies provided with orifice plate comprising a diameter (items 31) and said orifice plates arranged in a detachable manner (see Column 5, lines 48-61). Relating to claim 2, the said orifice plates are located in the said fuel assembly flow channel, relating to claims 3, 4, 9, 10, and 22, the said flow orifice plates are sized to maintain coolant flow rates in the core regions depicted in Figure 1 (see Column 6, lines 24-47), relating to claims 5-7, 14-16, 19-21, the reference discloses that the variations between core region coolant flows that read on the cited claims (see Column 4, lines 40+, Column 7, lines 12-22), relating to claims 8, 11, 12, 17, the reference discloses the said orifice plates are arranged to detachably coupled to the lower fuel assembly structure (see Column 5, lines 48-62).

The primary reference discloses the claimed invention except for citing three core flow regions. The secondary reference discloses that it is well known in the fast reactor art to arrange nuclear cores with tipartite flow rate regions. It would have been obvious to one of ordinary skill in the nuclear fuel art at the time of the invention to have specified

that the flow regions disclosed in the primary reference (see Patterson, Column 3, lines 28+, Column 4, lines 1-18) could have been arranged with three zones (see Yasuyuki, Abstract, Constitution) as such an arrangement is well known in the fast reactor art to optimize core flow rates based on fuel burn-up / combustion.

Apparatus claims cover what a device *is,* not what a device *does.* *Hewlett-Packard Co. v. Bausch & Lomb Inc.,* 15 USPQ2d 1525, 1528.

As set forth in MPEP§ 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

4). Claims 1, 2, 13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baxi (U.S. 4,303,474) in view of JP 06-289178 (Yasuyaki).

The primary reference discloses an apparatus that is inherently capable of operating and functioning in the manner claimed comprising a boiling water reactor (BWR) nuclear power reactor core (item 2), a plurality of fuel assemblies (items 13), each of said assemblies incorporating a flow opening / channel, a lower tie-plate / support structure (item 42), the said fuel assemblies arranged in a plurality of core regions (see Figure 1), and the said core regions configured to specific core coolant flows and each of the said fuel assemblies provided with flow orifices plates comprising a diameter (items 15), the said orifice plates arranged in a detachable manner (see Figure 4), and relating to claim

2, the said orifice plates are located in the said fuel assembly flow channel (see Figures 2-3).

The primary reference discloses the claimed invention except for citing three core flow regions. The secondary reference discloses that it is well known in the fast reactor art to arrange nuclear cores with tipartite flow rate regions. It would have been obvious to one of ordinary skill in the nuclear fuel art at the time of the invention to have specified that the flow regions disclosed in the primary reference (see Baxi, Figure 1) could have been arranged with three zones (see Yasuyuki, Abstract, Constitution) as such an arrangement is well known in the fast reactor art to optimize core flow rates based on fuel burn-up / combustion.

5). Claims 1, 2, 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johansson et al (DE 3150477A1) in view of Nakamura et al (U.S. 5,1096,575). The primary reference discloses an apparatus that is inherently capable of operating and functioning in the manner claimed comprising a light water reactor nuclear power reactor core with a plurality of fuel assemblies / bundles (items 3), each of said assemblies incorporating a flow opening / channel (item 1), a lower tie-plate / support structure (item 2'), the said fuel assemblies arranged in a plurality of core flow water distribution regions (see translation, page 2, last paragraph) and the said core regions configured to specific core coolant flows by means of a plurality of flow orifices plates /

throttling elements comprising a diameter (see for example, items 7, 7', 22, 28 and 40), the said orifice plates arranged in a detachable / exchangeable manner (see Claim 1) and relating to claim 2, the said orifice plates are located in the said fuel assembly flow channel (see Figures 1, 3, 7).

The primary reference discloses the claimed invention except for citing three core flow regions. The secondary reference discloses that it is well known in the light water reactor art to arrange nuclear cores with a plurality of coolant flow rates based on coolant velocity profiles. It would have been obvious to one of ordinary skill in the nuclear fuel art at the time of the invention to have specified that the flow regions disclosed in the primary reference (see Johansson et al, translation, page 2, last paragraph) could have been arranged with three zones (see Nakamura et al, Figure 5, Column 4, lines 56+, Column 6, lines 1-22) as such an arrangement is well known in the light water reactor fuel art in order to provide an idealized coolant flow distribution above and in the vicinity of the lower tie-plate.

6). The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7). Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Richardson whose telephone number is (703) 305 0764. The examiner can normally be reached on Monday to Thursday from 7.00 AM to 4.30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306 4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 1113.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications can be obtained from either private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http:// pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John Richardson, PE,

October 03 2004.

MICHAEL [illegible]CONE
SUPERVISORY PATENT EXAMINER